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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/486,183	08/17/2000	Ian L. Gray	540-188	3135
23117	7590	01/06/2004	EXAMINER	
NIXON & VANDERHYE, PC 1100 N GLEBE ROAD 8TH FLOOR ARLINGTON, VA 22201-4714				
			AFTERGUT, JEFF H	
			ART UNIT	PAPER NUMBER
			1733	

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Please find below and/or attached an Office communication concerning this application or proceeding.

# Office Action Summary

Application No. 09/486,183	Applicant(s) GRAY, IAN L	
Examiner Jeff H. Aftergut	Art Unit 1733	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

## Status

- 1) ☒ Responsive to communication(s) filed on 05 November 2003.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

## Disposition of Claims

- 4) ☒ Claim(s) 12-24 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 12-24 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

## Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
 Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
 Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

## Priority under 35 U.S.C. §§ 119 and 120

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
 a) ☐ All b) ☐ Some \* c) ☐ None of:  
 1. ☐ Certified copies of the priority documents have been received.  
 2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.  
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).  
 \* See the attached detailed Office action for a list of the certified copies not received.
- 13) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application) since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.  
 a) ☐ The translation of the foreign language provisional application has been received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121 since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.

## Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892) 4) ☒ Interview Summary (PTO-413) Paper No(s): \_\_\_\_
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948) 5) ☐ Notice of Informal Patent Application (PTO-152)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) \_\_\_\_\_ 6) ☐ Other:

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1. In light of the 12-17 interview with Mr. Richard Crispino, the prosecution of the application is hereby reopened. Applicant will find below a new Office action addressing claims 12-24 as presented in the amendment dated 11-5-03. No other claims are pending in the application. No claims are allowed.

*Claim Rejections - 35 USC § 102/103*

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless --

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claims 12-14, 16, 18, 20 and 21 are rejected under 35 U.S.C. 102(b) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over Vane.

Vane suggested that it was known at the time the invention was made to form a composite article via a pultrusion operation, see Figure 3. in particular, the reference suggested that one skilled in the art would have provided a reinforcing material 13 in a reinforcing material producing means 14 and fed the same to a pultrusion die 28 where resin was injected into the reinforcement by suitable injecting means 31 from supply 32. the formed article is then suitably cured by a curing means 26 in order to solidify the resin therein. The reference taught that the forming means 14 for forming the fabric included the introduction of independent reinforcing

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components 3a, 4a can be added to the various plies of reinforcement 1-6 formed from reinforcing fibers in order to provide additional reinforcement at a required local in the finished end product, column 5, lines 60-65. the reference suggested that various types of yarns would have been suitable for the operation including the use of glass fibers as well as carbon fiber for the reinforcement. The reference failed to state that the additional reinforcements 3a, 4a would have been provided from a fiber material different from the fiber material of the other plies in the composite, however in order to provide additional reinforcement in a localized region, depending upon the necessary characteristics of the finished assembly, one skilled in the art would have understood that fibers of a different type would have been provided in different regions of the finished assembly. It would have been obvious to one of ordinary skill in the art of pultrusion to provide different fibers in additional pieces added to the reinforcement plies in Vane in order to alter the reinforcing properties of the finished assembly in the process of making a composite having a varied strength characteristic along the length of the same.

With regard to claims 13 and 14, note that the inclusion of different types of fibers would have necessarily resulted in variance in fiber tenacity and fiber modulus. Regarding claim 16, note that the plies were stitched together thus forming a finished assembly which included the interlaced additional reinforcement. Regarding claim 18, the reference to Vane suggested that those skilled in the art of pultrusion would have coated the filament reinforcement prior to introduction into the pultrusion die. Regarding claim 20, note that the laying up of the fibers according to the techniques of Vane to form the perform provided the fibers in the form of a nonwoven. Note regarding claim 21 that the reference to Vane suggested the formation of a finished fiber reinforced composite assembly.

*Claim Rejections - 35 USC § 103*

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6. Claims 12-14, 16, 18, 20 and 21 are rejected under 35 U.S.C. 103(a) as being unpatentable over Vane in view of any one of Kalnin, Durand et al or Gorthala et al.

Vane is discussed above in paragraph 4 and applicant is referred to the same for a complete discussion of the reference. The reference failed to expressly suggest that one skilled in the art would have utilized different fiber material in the additional layers which were added in order to impart additional strength in the localized regions where the same were applied. The reference to either one of Kalnin, Durand et al or Gorthala et al suggested that those skilled in the art would have understood that the fibers from one layer to another layer would have been varied in order to attain the desired strength in the finished assembly. Namely the reference to Kalnin suggested that those skilled in the art would have employed both fibers of glass and carbon in the fiber reinforced composite in order to attain a finished composite of the desired stiffness and strength. Regarding Gorthala, the reference suggested that those skilled in the art would have applied plural layers of fibers in a pultrusion operation wherein various layers of the fibers included fibers of differing compositions in order to achieve the desired strength in the finished assembly. Durand et al suggested that one skilled in the art would have utilized various types of fibers in a pultrusion in order to impart the desired characteristics of the finished product, column 2, lines 45-55. It would have been obvious to one of ordinary skill in the art at the time the

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invention was made to incorporate a different type of reinforcing fiber in the composite of Vane in order to alter the stiffness and/or strength in the finished assembly as such was known in composite manufacture as suggested by Kalnin, Durand et al or Gorthala et al.

7. Claim 15 is rejected under 35 U.S.C. 103(a) as being unpatentable over the references as set forth above in paragraph 6 further taken with any one of Yokota et al or Street.

The references as set forth above suggested that those skilled in the art at the time the invention was made would have intermixed various types of fibers together in order to impart the desired final strength characteristics to the finished pultruded composite. It should be noted that the additional reinforcement was added at various points along the length of the product. The references failed to teach that those skilled in the art of composite article manufacture and in particular pultrusion would have known at the time the invention was made to incorporate fibers along the length of the composite article via a splicing operation where lengths of the reinforcement were assembled together in order to vary the fiber content along the length of the finished assembly. However, the use of splicing in the process of manufacturing composite articles on a continuous basis was known per se as evidenced by either one of Yokota et al or Street. More specifically, Yokota suggested that it was known at the time the invention was made to splice fiber tows together in a pultrusion operation in order to provide a continuous supply of the fiber tow in the operation. Street suggested that in order to provide continuous supplies of fiber in composite article manufacture the ends of the fibers would have been spliced together. Because Vane suggested that those skilled in the art at the time the invention was made would have incorporated various kinds of reinforcement along the length of the pultruded part and it was known to splice fibers together to provide a supply of the same in a pultrusion

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operation, it would have been obvious to one of ordinary skill in the art at the time the invention was made to employ splicing as a technique to intermingle the various fibers as such techniques were known as suggested by Yokota et al or Street in the process as set forth above in paragraph 6.

8. Claim 17 is rejected under 35 U.S.C. 103(a) as being unpatentable over the references as set forth above in paragraph 6 further taken with any one of Beall (newly cited), Gabriele (newly cited, the article from Plastics Technology entitled "Pultrusion's Promise"), Martin et al (newly cited, the portion of the book entitled "Pultrusion" from the Engineered Materials Handbook, Vol. 1).

While the references as set forth above suggested that those skilled in the art when pultruding would have impregnated the reinforcement prior to entry into the shaping die (Vane employed an impregnation bath prior to the die), the references failed to teach that that it was known per se as an alternative in the art of pultrusion to impregnate the filament reinforcement in the die (rather than prior to introduction into the same in a bath). The references to any one of Beall (column 5, lines 50-66), Gabriele (page 38, lines 9-29 of the left column, note that Gabriele suggested that injection was preferred due to the reduction in emissions from the resin material), and Martin et al (page 534, right column, lines 3-15 and lines 44-47, for example) suggested that it was known to introduce the resin to the reinforcement either prior to entry into the die or at the die itself. It is well settled that where, as here, two equivalents are interchangeable for their desired function, an express suggestion of the desirability of the substitution of one for the other is not needed to render such substitution obvious, In re Fout, 213 USPQ 532, In re Siebentritt, 152 USPQ 618. It would have been obvious to one of ordinary skill in the art at the time the

invention was made to employ resin impregnation at the die as opposed to prior to entry into the die as such were well known alternatives in the art as evidenced by any one of Gabriele, Martin et al, or Beall in the process of pultruding as set forth above in paragraph 6.

9. Claims 19 and 20 are rejected under 35 U.S.C. 103(a) as being unpatentable over the references as set forth above in paragraph 6 further taken with any one of Martin et al (newly cited, the portion of the book entitled "Pultrusion" from the Engineered Materials Handbook, Vol. 1) or Krutchkoff (the portion of the article from Plastics Design & Processing entitled "Process Converts Thermoset Materials Into Finished Shapes Continuously", newly cited).

The references as set forth above in paragraph 6 suggested that those skilled in the art would have incorporated a reinforcement in the form of a nonwoven in the pultrusion operation. The reference to Vane failed to expressly state that one skilled in the art would have utilized a woven material during pultrusion. The art is replete with examples where one employed a reinforcement in the form of a woven material during pultrusion and one skilled in the art would have readily appreciated that the form of the reinforcement was a function of the desired strength characteristics one wished to attain in the finished assembly as evidenced by either one of Martin et al (page 537, left column line 1-page 538, middle column, line 27) or Krutchkoff, page 37, under the heading "Reinforcement Materials", suggested that one skilled in the art would have readily appreciated that either non-woven or woven fabric material reinforcements would have been suitable in the pultrusion operation and that the selection of a non-woven or a woven fabric material would have been a function of the desired strength characteristics one wished to attain in the final assembly. It would have been obvious to one of ordinary skill in the art at the time the invention was made to employ either non-woven or woven reinforcement in a pultrusion



operation as such were art recognized reinforcements useful in pultrusion dependent upon the desired strength characteristics needed in the finished assembly as suggested by either one of Krutchkoff or Martin et al in the operation of pultruding as set forth above in paragraph 6.

10. Claims 21-24 are rejected under 35 U.S.C. 103(a) as being unpatentable over the references as set forth above in paragraph 6 further taken with the applicant's admitted prior art (newly cited, see page 1, lines 4-9).

The references as set forth above in paragraph 6 suggested that those skilled in the art would have known to incorporate a reinforcement in the continuous reinforcing perform at the local where one desired the increase in strength and/or additional properties. The references clearly produced a composite article via the pultrusion operation in Vane. There is no indication that the pultruded part was intended for use as an aircraft skin stringer where an aircraft foil incorporated the stringer therein. However, the applicant has admitted at page 1 of the specification that: "It is known to manufacture by pultrusion, composite structural members for use as skin stringers for aircraft wing and fuselage skins, for example." Clearly, in order to provide reinforcement where desired, one skilled in the art at the time the invention was made forming a pultruded composite member such as a skin stringer for aircraft wings and fuselage would have readily appreciated that it would have been obvious to utilize the techniques as set forth above in paragraph 6 to form such conventional pultruded stringers as admitted by applicant as was known in the art of pultrusion.

#### ***Response to Arguments***

11. Applicant's arguments filed 11-5-03 have been fully considered but they are not persuasive.

The applicant argues that the reference to Vane did not teach the application of additional fibers in the perform prior to the pultrusion operation and that therefore the claims at hand are allowable over the prior art of record. The applicant argues that they were the first to add additional reinforcement in a single pultrusion operation and that the operation of Vane would not work as the additional reinforcement patches therein would cause distortion in the finished assembly. Regarding this distortion, the applicant is advised that one skilled in the art would have expected that, as a patent, the proposed operation suggested by Vane would in fact work. Applicant is advised that in those regions where the additional reinforcement was added, the resin in the composite article would be displaced and in the flowing of the die, those areas where the patches were disposed would have had less resin in them in the finished assembly (and additional reinforcement) as opposed to those regions in the cross section which do not have the additional reinforcement.

Additionally, regarding Vane, the applicant is advised that Vane did in fact teach formed a perform with additional reinforcing fibers disposed in the perform of continuous fibers and that these additional patches of reinforcement were added where the additional reinforcement was desired in the finished assembly. Following perform manufacture (the lay up and stitching of the fiber assembly), the reference to Vane suggested feeding of the perform to a pultrusion molding process. The applicant is referred to Figure 1 for the formation technique used to make the reinforcement (the perform) and Figure 3 for the molding of the reinforcement formed according to the techniques of Figure 1 via pultrusion. Applicant is also referred to column 2, lines 26-36, column 2, lines 50-57, column 3, lines 34-47, column 4, lines 15-19, and column 5, lines 60-65. clearly, the accumulator 15 of Figure 3 was used to accumulate the reinforcement produced at 14

(according to the techniques of Figure 1) prior to pultrusion of the reinforcement in a pultrusion die 28. additionally, the reference to Vane clearly suggested that those skilled in the art would have incorporated patches of supplemental reinforcement 3a and 4a for example in the reinforcing fibers of the reinforcement in order to provide the pultruded body with reinforcement where desired in the finished assembly. Applicant's argument to the contrary is not persuasive.

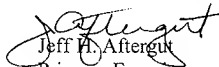
The applicant clearly was not the first to add additional reinforcement in desired locals in a pultrusion operation as suggested. No claims are allowed.

### ***Conclusion***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jeff H. Aftergut whose telephone number is 703-308-2069. After December 18, 2003, the examiner can be reached at 571-272-1212. The examiner can normally be reached on Monday-Friday 6:30-3:00pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Richard Crispino can be reached on 703-308-3853. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-0661.

  
Jeff H. Aftergut  
Primary Examiner  
Art Unit 1733

JHA  
December 18, 2003